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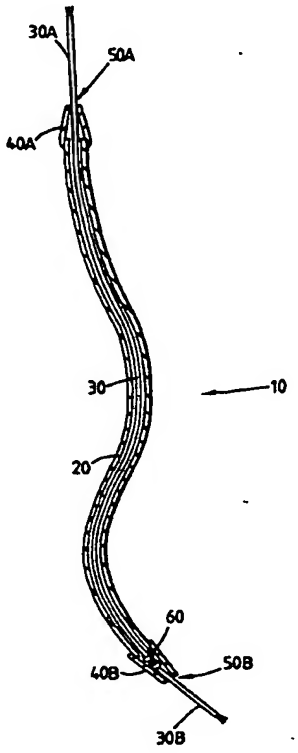
(57) Abstract

There is disclosed a device (10, 10', 10'') which seeks to prevent kinking, twisting or intertwining of a spiral wire/flex/cable (70). It is a common problem in normal operation that a spiral wire (70) can become twisted causing kinking with two or more coils (95) of the spiral possibly intertwining. Accordingly, the invention provides a device (10, 10', 10'') comprising an elongate flexible member (20, 20', 20'') (insert) for insertion into a hollow core (75) of a spiral wire (70). The device (10, 10', 10'') further comprises a length of elasticated material (30, 30', 30'') extending along a length of the member (20, 20', 20''), each end of the elasticated material (30, 30', 30'') being securable by securing means to a respective end of the wire (70), in use, whereby when the wire (70) is stretched the elasticated material (30, 30', 30'') is stretched, and when the wire (70) is not stretched the elasticated material (30, 30') returns the wire (70) so as to coil over the member (20, 20', 20'').



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ANTI-TWIST DEVICE

The present invention relates to spiral wires, flex, or cables, hereinafter referred to as "spiral wire". The invention relates particularly, though not exclusively, to a device for preventing the kinking, twisting or intertwining of a spiral wire.

Elastically stretchable spiral wires are used in a number of applications where connection between a relatively static object and a moveable object is required, such as connecting a telephone handset to a telephone base or a computer keyboard to a computer housing. The spiral wire is designed to contract and coil neatly when the ends are in close proximity, while being able to extend substantially when the ends are stretched apart. It is a common problem in normal operation that the wire can become twisted causing kinking with two or more coils of the spiral possibly intertwining thus affecting the appearance when contracted and the extensibility of the flex in use.

One prior art device has sought to solve this problem by providing a 360° free rotating mount between one end of the wire and the static object. In this device any twists in the flex are supposedly counteracted by the mount rotating and kinking, twisting and intertwining are sought to be prevented.

A prime disadvantage of this solution is that a 360° free rotating mount does not provide for uninterrupted wiring between the flex and the static object. The surface to surface contact within the mount may cause signal loss and is difficult to maintain when the wiring is multicore, e.g. telephone cable. In addition the rotatable mount can only be retrofitted if the spiral flex is detachable from the static object.

It is an object of at least one embodiment of the present invention to provide a device for use with a spiral wire which obviates or mitigates at least one of the aforementioned disadvantages.

According to a first aspect of the present invention there is provided a device intended to prevent kinking and/or twisting of a spiral wire comprising an elongate flexible member for retention in association with a spiral wire.

Advantageously, the member is adapted for insertion into a hollow core of the spiral wire.

Advantageously also, the device further comprises a length of elasticated material retained in longitudinal relation to the member.

Preferably each end of the elasticated material may be securable by securing means to a respective end of the spiral wire, in use, whereby when the wire is stretched the elasticated material is stretched, and when the wire is not stretched the elasticated material returns the wire over the member.

Preferably the flexible member is a hollow tube.

The tube may be formed of a plastics material.

The flexible member may be a helical coiled body (spring coiled cable), such as that used for curtain rods.

The coiled body may be formed from a metallic material.

The flexible member may have a design or lettering embossed or printed thereupon.

Alternatively the insert may be at least partly coated in or covered with a material such as PVC, on which a design or lettering may be extruded or printed. The device may, therefore, be employed as a promotional type device.

Preferably the elasticated material is elastic. Alternatively the elasticated material may be rubber.

The securing means may comprise one or more knots formed in the elasticated material.

Alternatively the securing means may comprise glue, adhesive tape, a clip(s), or advantageously a cable tie.

In one embodiment of the invention the elasticated material is retained within the hollow tube insert.

Preferably end caps are provided at either end of the hollow tube, each end cap having an orifice through which the elasticated material passes.

The end caps may be tapered to facilitate insertion of the member into the hollow core of the spiral wire.

The elasticated material may be knotted, crimped to form a ball, or otherwise restrained at one end to prevent said one end from passing through an end cap when the elasticated material is stretched.

Preferably the elasticated material is fixed to one end cap so that the elasticated material is capable of passing through the other end cap.

According to a second aspect of the present invention there is provided a spiral wire including a device according to the first aspect.

According to a third aspect of the present invention there is provided an appliance including a spiral wire, the spiral wire including a device according to the first aspect.

The spiral wire may connect first and second objects forming at least part of the appliance.

The first object may be intended to be relatively static, in use, while the second object may be intended to be moveable, in use.

For example, the first object may be a base of a telephone and the second object may be a handset of the telephone.

The appliance may be a domestic or commercial appliance and may be selected from any one of: household equipment, office equipment, hospital equipment, or workshop equipment, e.g. a computer, telephone, facsimile machine, radio set, microphone, hair dryer, door entry phone, bar code scanner, portable tool, electric razor, electric smoothing iron, electric kettle, or the like, and may be used in vehicles such as cars, emergency service vehicles, e.g. police cars, ambulances, fire engines, aircraft, helicopters, ships or boats.

According to a fourth aspect of the present invention there is provided a tie-wrap including means for displaying information.

The information may comprise promotional material such as advertising, or may comprise informative material such as a telephone number or the like.

The display means may comprise a substantially planar member connected to or integrally formed with the tie-wrap.

The planar member may be in the form of a disc.

The tie-wrap may comprise an elongate member and a locking member.

A first end of the elongate member may be connected to the locking member.

A second end of the elongate member may be receivable and securable in the locking member, in use.

According to a fifth aspect of the present invention there is provided a device intended to prevent kinking or twisting of a spiral wire comprising an elongate flexible member for retention in association with a spiral wire, wherein the flexible member comprises a helical coiled body.

A number of embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, which are:

Figure 1 a longitudinal cross-sectional view of a first embodiment of a device according to the present invention;

Figure 2 a schematic view of a second embodiment of a device according to the present invention;

Figure 3 a perspective view of the device of Figure 1 or 2 in use with a telephone in a first position; and

Figure 4 a perspective view of the device of Figure 1 or 2 in use with a telephone in a second position;

Figure 5 a partial exploded side view of a third embodiment of a device according to the present invention;

Figure 6 a side view of an embodiment of a tie-wrap

according to the present invention; and

Figure 7 a partial side view of the tie-wrap of Figure 6 to an enlarged scale.

Referring initially to Figure 1 there is shown a device according to a first embodiment of the present invention, generally designated 10, and intended to prevent kinking, twisting or intertwining of a spiral wire.

The device 10 comprises an elongate flexible member (insert) in the form of a hollow flexible plastics tube 20 adapted for insertion into a hollow core of a spiral wire. Extending along a length of the tube 20 and within the tube 20 is a length of elastic 30 which has ends 30A,30B which project beyond ends of the tube 20. A pair of tapered end caps 40A,40B are provided at either end of the hollow tube 20. The end caps 40A,40B may be made of a plastics material. The end caps 40A,40B clip on to respective ends 30A,30B of the tube 20 by a push fit. The caps 40A,40B each have an orifice 50A,50B through which the elastic 30 passes. The elastic 30 include a knot 60 near one end 50B to restrain the elastic 30 so as to prevent the one end 50B from passing through the end cap 40B or tube 20 when the elastic 30 is stretched (as described hereinafter). In place of knot 60 a crimped ball or eyelet secured to the elastic 30, may be used as hereinafter described with reference to Figure 5.

Referring now to Figure 2 there is depicted a device according to a second (preferred) embodiment of the present invention, generally designated 10'. The device 10' of Figure 2 is similar in many respects to the device 10 of Figure 1, like parts being identified by like numerals, but suffixed "'".

Device 10' comprises an elongate flexible member (insert) in the form of a spring coiled cable 20' adapted for insertion into a hollow core of a spiral wire; elastic 30' and end caps 40A',40B' having orifices 50A', 50B' respectively. Orifice 50B' has a diameter substantially equal to a diameter of the elastic 30'. When the elastic

30' is pushed through the orifice 50B' such that the end 30B extends therethrough - by approximately 3.5cm - the elastic 30' is glued in place to the end cap 22A'.

The elastic 30' is fed through cable 20' and end cap 50A'. The orifice 50A' of end cap 40A' is sufficiently large to allow free unimpeded passage of the elastic 30'. Cable 20' is inserted into each end cap 40A',40B' and fixed, for example, using PTFE ribbon or a suitable adhesive. Ends 30A',30B' of the elastic 30' are provided with stops in the form of knots 32A', 32B' which are used as fixing points as described hereinafter.

Referring now to Figure 5 there is depicted a device according to a third embodiment of the present invention, generally designated 10''. The device of Figure 5 is similar in many respects to the device 10 of Figure 1, like parts being identified by the numerals, but suffixed "''".

Device 10'' comprises an elongate flexible member in the form of a spring coiled cable 20'' adapted for insertion into a hollow core of a spiral wire; elastic 30'' and end cap 40B'' having an orifice 50B''.

The elastic 30'' is fed through cable 20''. Cable 20'' is inserted into end cap 40B'' and fixed, for example, using PTFE ribbon or a suitable adhesive. The elastic 30'' is provided with a crimped eyelet 60'' near one end 50B'' to restrain the elastic from passing through the end cap 40B'' when the elastic 30'' is stretched.

Referring now to Figures 3 and 4, the device 10,10', 10'' of the invention may be used with a telephone, generally designated 65, having a spiral wire 70 extending between a telephone base 80 and a handset 90 of the telephone 65.

In use, the device 10, 10', 10'' is inserted into a core 75 of the spiral wire 70, the tapered end caps 40A,40B,40A',40B', 40B'' facilitating this process. The tube 20/ cable 20', 20'' is generally substantially the same length as the unstretched spiral wire 70. End 30B,30B',30B'' of elastic 30,30',30'' may be conveniently

retained on the wire 70 adjacent the base 80, and end 30A,30A' may be conveniently retained on the wire 70 adjacent the handset 90.

When the handset 90 is placed on the telephone base 80 the spiral wire 70 and member 20,20',20'' adopt a generally "U-shaped" form - with the spiral wire 70 supported on the member 20. Telephone base 80 may be releasably secured to the surface it rests upon by rubber stoppers or Blu-Tack® (Bostik) or the like. Alternatively the base 80 may be fixed to a wall or other fixed object.

When the telephone 65 is used as shown in Figure 4, the wire 70 may be stretched, and thus the elastic 30,30',30'' is stretched, with coils 95 of the spiral wire 70 peeling off the tube 20/cable 20',20''. As the elastic 30,30',30'' stretches it extends through the orifice 50A,50A', with the end 30B,30B',30B'' being retained by suitable attachment to end cap 40B,40B',40B''. After use when the handset 90 is replaced on the base 80, the wire 70 is no longer stretched and the contraction of the elastic 30,30',30'' returns the wire 70 into its contracted state over the tube 20/cable 20',20'' as can be seen from Figure 3.

If desired, the ends 30A,30B, 30A',30B', 30B'' of the elastic 30,30',30'' may be secured to the ends of the wire 70 by ties, e.g. cable ties/tie wraps (not shown) located between the knots 32A',32B' and the tube 20/cable 20',20''. The knots 32A',32B' seek to ensure that the ends 30A,30B' of the elastic 30,30' do not slip through the cable tie.

The device 10,10',10'' may have a tube 20/cable 20',20'' length of approximately 23.5cm for use with a spiral wire having contracted length of approximately 30 to 40cm. For a spiral wire of approximately 61 to 73cm in contracted coiled length a tube 20/cable 20',20'' length of approximately 53.5cm may be used. The tube 20/cable 20',20'' diameter may be around 5mm as this diameter is cheaply available, being sold as curtain rod. However, it will be understood that other suitable diameters of tube

20/cable 20',20'' may be used.

It will be appreciated from the foregoing that a device according to the invention tends to prevent a spiral wire from kinking, twisting or intertwining

It is readily apparent from the foregoing that the member 20,20',20'' seeks to prevent the wire 70 from kinking or twisting primarily when the handset 90 rests on the base 80, while the elastic 30, 30',30'' allows a user to pick-up and use the handset 90 stretching the wire 70 in a conventional manner, and thereafter to return the handset 90 to the base 80, the wire 70 contracting back to its unexpanded length, resting over the tube 20/cable 20',20''.

It will be understood that a device of the present invention may take a different form to that specifically described above. For example, the member may be suitably retained on the spiral wire external thereof. Further, the member need not be a hollow tube or cable, and the elastic could be on the outside of the member. A plastic sheath may cover the cable. The end caps could be crimped in place, could be dispensed with or integrally formed with the tube, or just one end cap could be provided.

Yet further, the device could be made in a variety of lengths, and/or diameters, and of any desired colour(s) or print designs.

As illustrated in Figures 3 and 4 the device 10,10' may be provided with printing/patterning 99 on an outer surface thereof - e.g. a surface of a sleeve. The printing may be purely ornamental, may be informative (e.g. a telephone number) or may be of a promotional/advertising nature.

The device could be sold in combination with a spiral wire, and the spiral wire could be part of equipment other than a telephone, e.g. a computer, radio set, microphone, hair dryer, door entry phone, bar code scanner or other appliance.

Referring to Figures 6 and 7 there is shown a securing means in the form of a tie-wrap 100 including means 105 for

displaying information. The tie-wrap 100 is suitable for securing the ends 30A,30B,30A',30B',30B'' of the elastic 30,30',30'' to the ends of the wire 70, as hereinbefore mentioned.

The information may comprise promotional material such as advertising or may comprise informative material such as a telephone number of the like.

In this embodiment the display means 105 comprise a substantially planar member 110 integrally formed with the tie-wrap, the planar member 110 being in the form of a disc.

The tie-wrap 100 comprises an elongate member 115 and a locking member 120. A first end 125 of the elongate member 115 is connected to the locking member 120, while a second end 130 of the elongate member 120 is lockably receivable within the locking member 120, in use.

This locking is provided by a co-acting locking lug 135 within a through-hole 140 in the locking member and serrated teeth 145 on the elongate member 115, as is known in the art.

As can be seen from Figure 7 the planar member 110 may include a recessed portion 140 for reception of printed matter or the like, such as a logo sticker.

The tie-wrap 100 may be of the following dimensions:

locking member 120 - height 3 to 4mm

planar member 110 - diameter 15mm

height 1 to 2mm

It will be appreciated that the embodiments of the invention hereinbefore described are given by way of example only, and are not meant to limit the scope in any way. In particular modifications will be apparent to those skilled in the art without departing from the scope of the present invention.

CLAIMS

FIRST CLAIM SET

1. A device intended to prevent kinking and/or twisting of a spiral wire comprising an elongate flexible member for retention in association with a spiral wire.

2. A device as claimed in claim 1, wherein the member is adapted for insertion into a hollow core of the spiral wire.

3. A device as claimed in either of claims 1 or 2, wherein the device further comprises a length of elasticated material retained in longitudinal relation to the member.

4. A device as claimed in claim 3, wherein the length of elasticated material extends along a length of the member.

5. A device as claimed in claim 4, wherein each end of the elasticated material is securable by securing means to a respective end of the spiral wire, in use, whereby when the wire is stretched the elasticated material is stretched, and when the wire is not stretched the elasticated material returns the wire over the member.

6. A device as claimed in any of claims 1 to 5, wherein the flexible member is a hollow tube.

7. A device as claimed in claim 6, wherein the tube is formed of a plastics material.

8. A device as claimed in any of claims 1 to 7, wherein the flexible member is a helical coiled body.

9. A device as claimed in claim 8 when not dependent upon claim 7, wherein the body is formed from a metallic material.

10. A device as claimed in claim 9, wherein a design or lettering is embossed on the flexible member.

11. A device as claimed in either of claims 8 or 9, wherein the member is at least partially coated or covered in a material such as PVC, on which a design or lettering is extruded, embossed or printed.

12. A device as claimed in any of claims 3 to 11, wherein the elasticated material is elastic.

13. A device as claimed in any of claims 3 to 11, wherein the elasticated material is rubber.

14. A device as claimed in claim 5 or any of claims 6 to 13 when dependent on claim 5, wherein the securing means comprise one or more knots formed in the elastic material.

15. A device as claimed in claim 5 or any of claims 6 to 13 when dependent on claim 5, wherein the securing means comprise glue, adhesive tape, a clip(s) or a cable tie(s).

16. A device as claimed in claim 3 or any of claims 4 to 15 when dependent on claim 3, wherein the elasticated material is retained within the hollow tube.

17. A device as claimed in claim 16, wherein end caps are provided at either end of the hollow tube, each end having an orifice through which the elasticated material passes.

18. A device as claimed in claim 17, wherein the end caps are tapered to facilitate insertion of the member into the hollow core of the spiral wire.

19. A device as claimed in either of claims 17 or 18, wherein the elasticated material is restrained at one end to prevent said one end from passing through an end cap when the elasticated material is stretched.

20. A device as claimed in any of claims 17 to 19, wherein the elasticated material is fixed to one end cap so that the elasticated material is capable of passing through only the other end cap.

21. A spiral wire including a device according to any of claims 1 to 20.

22. An appliance including a spiral wire, the spiral wire including a device according to any of claims 1 to 20.

23. An appliance as claimed in claim 22, wherein the spiral wire connects first and second objects forming at least part of the appliance.

24. An appliance as claimed in claim 23, wherein the first object is intended to be relatively static, in use, while the second object is intended to be moveable.

25. An appliance as claimed in claim 24, wherein the appliance is a telephone.

26. An appliance as claimed in any of claims 22 to 24, wherein the appliance is selected from any one of a domestic or commercial appliance such as household equipment, office equipment, hospital equipment or workshop equipment.

27. An appliance as claimed in any of claims 22 to 24 or claim 26, wherein the appliance is selected from a computer, telephone, facsimile machine, radio set, microphone, hair dryer, door entry phone, bar code scanner, portable tool, electric razor, electric smoothing iron, electric kettle or the like.

28. A tie-wrap including means for displaying information.

29. A tie-wrap as claimed in claim 28, wherein the information comprises promotional material such as advertising or informative material such as a telephone number or the like.

30. A tie-wrap as claimed in either of claims 28 or 29, wherein the display means comprises a substantially planar member connected to or integrally formed with the tie-wrap.

31. A tie-wrap as claimed in claim 30, wherein the planar member is in the form of a disc.

32. A tie-wrap as claimed in any of claims 28 to 31, wherein the tie-wrap comprises an elongate member and a locking member.

3. A tie-wrap as claimed in claim 32, wherein a first end of the elongate member is connected to the locking member.

34. A tie-wrap as claimed in claim 33, wherein a second end of the elongate member is receivable and securable in the locking member, in use.

SECOND CLAIM SET

35. A device intended to prevent kinking or twisting of a

spiral wire comprising an elongate flexible member for retention in association with a spiral wire, wherein the flexible member comprises a helical coiled body.

36. A tie-wrap including means for displaying information.

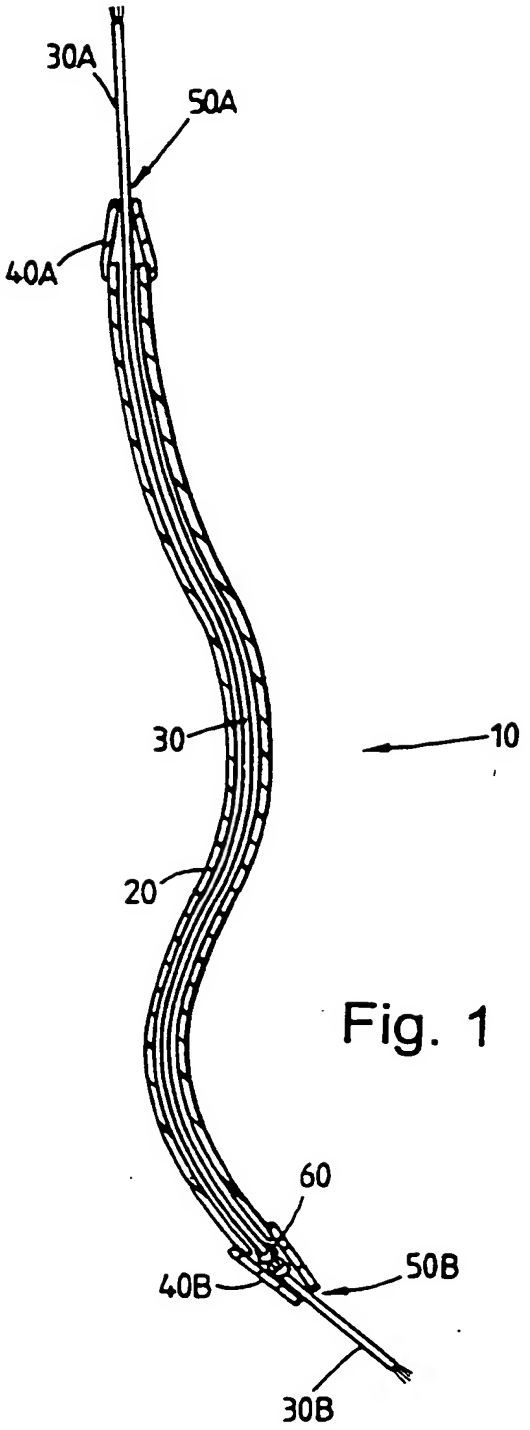
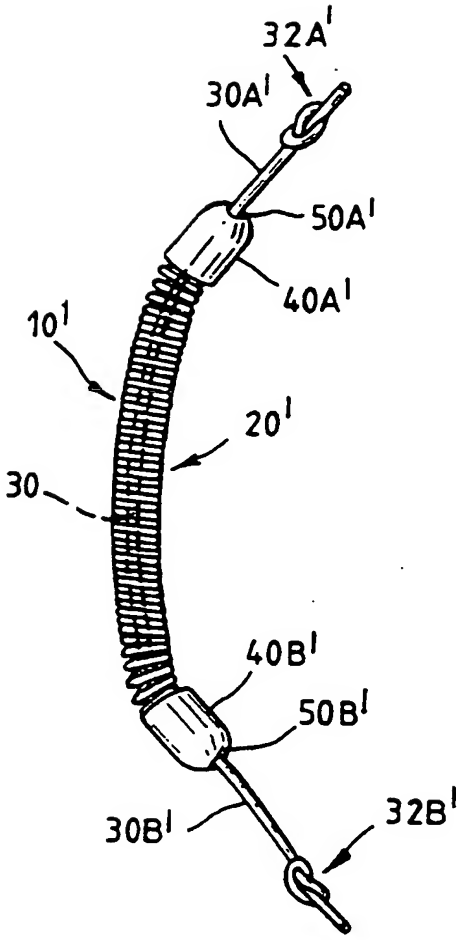

30A
50A
40A
30
10
20
60
40B
50B
30B

Fig. 1


32A'
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10'
20'
30
40B'
50B'
30B'
32B'

Fig. 2

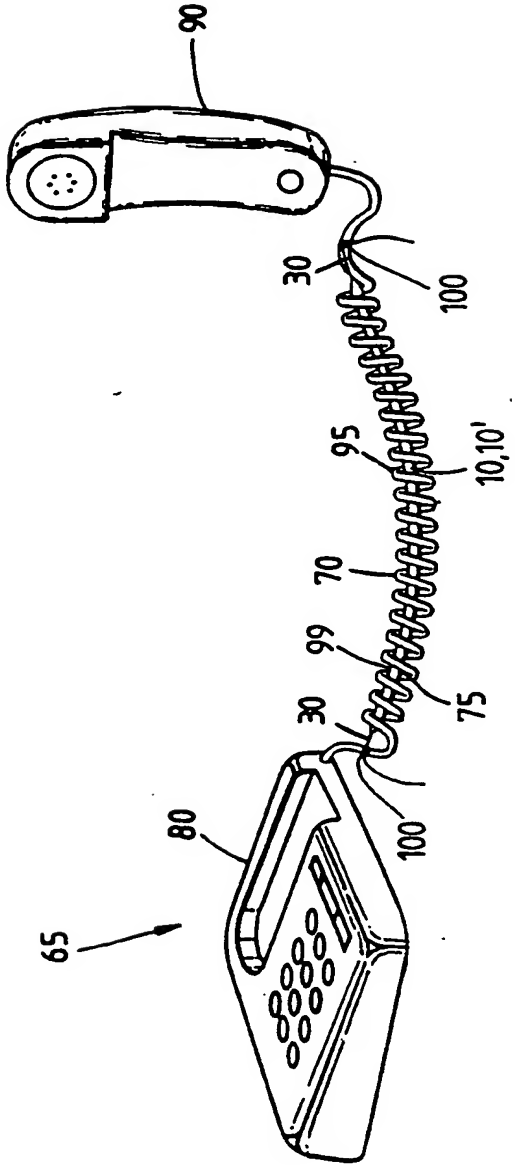
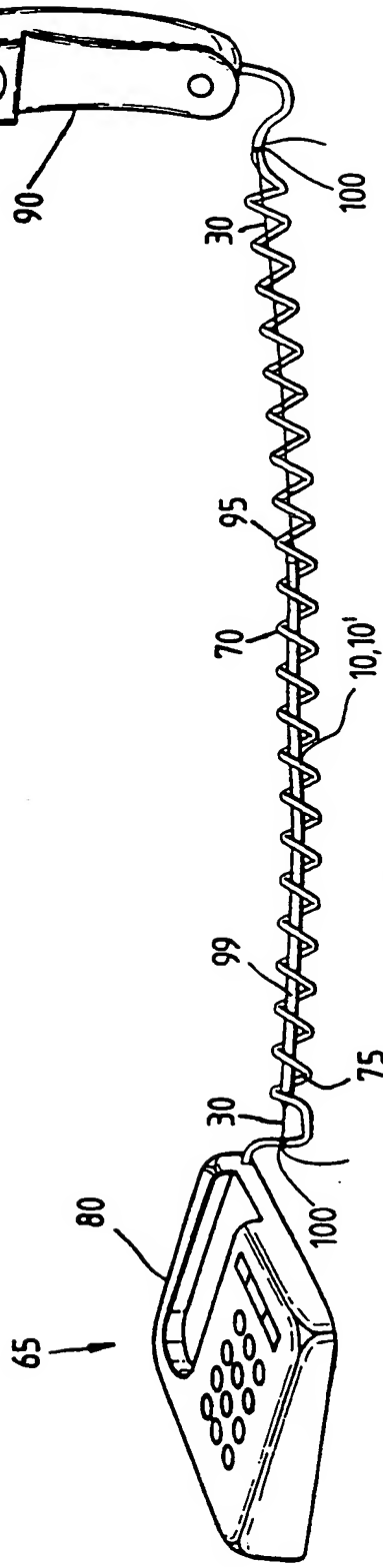

90
30
100
95
10,10'
70
99
75
30
80
100
65

Fig. 3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30
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10,10'
99
75
30
80
100
65

Fig. 4

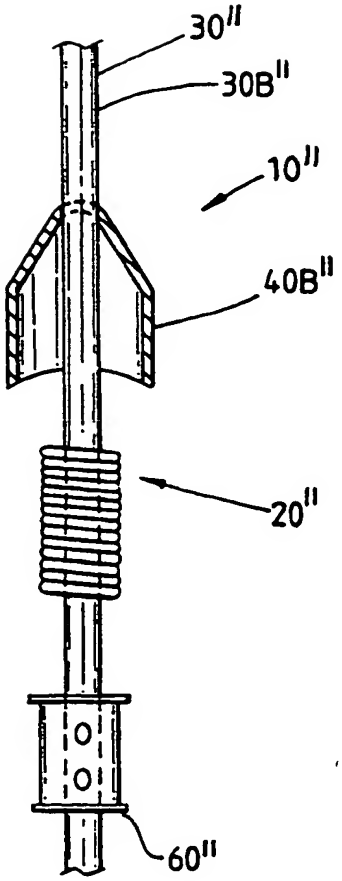

Fig. 5

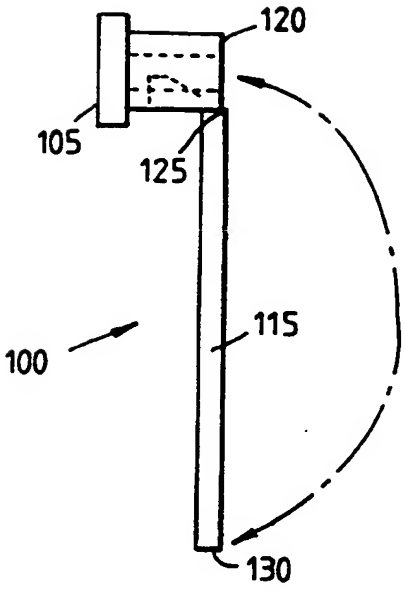

Fig. 6

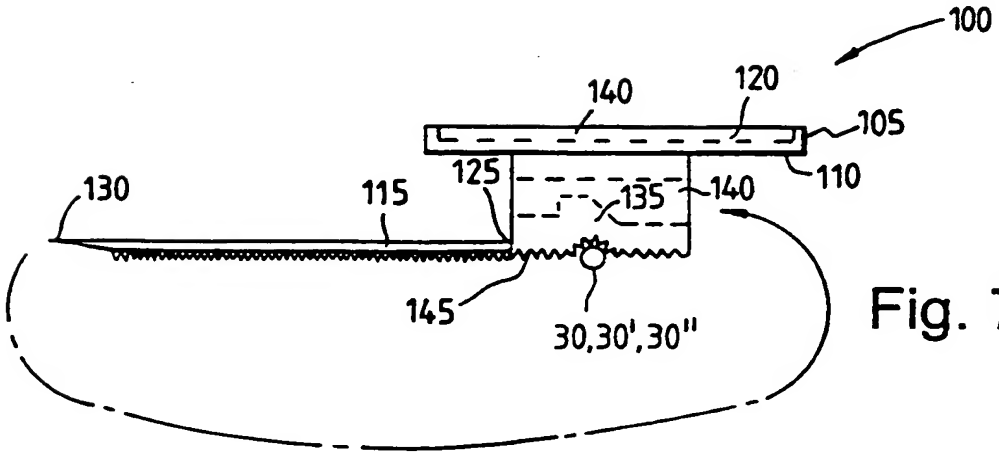

Fig. 7